The outstanding Official Action includes an objection to the previous addition of "at a substrate temperature which is greater than 1100°C but less than or equal to 1350°C" to Claims 9 and 25-29 under 35 U.S.C. §132, a rejection of Claims 9-11, 14, 15, and 24-29 under the first paragraph of 35 U.S.C. §112, a rejection of Claims 9, 11, 14, 15 and 24-29 under 35 U.S.C. §103(a) as being unpatentable over Bose et al (U.S. Patent No. 5,492,858, Bose), and a rejection of Claim 10 under 35 U.S.C. §103(a) as being unpatentable over Bose in view of the Wolf et al article "Silicon Processing for the VLSI Erra," Wolf).

Applicants acknowledge with gratitude the interview granted by Examiners Mai and Chaudhuri on May 10, 2001. During this interview, Applicants' representative pointed out that In re Blaser, 194 USPQ 122, 125 (CCPA 1977) and In re Wertheim, 191 USPQ 90 (CCPA 1976) established that disclosure of a broad range provides support for claiming a narrower range within that broad range. Copies of the Blaser decision were provided at the interview and attached hereto is a copy of the pertinent page from Wertheim noting that a claim recitation of a range of 35-60% is supported by a disclosure of a broader range of 25-60%.

Accordingly, the present amendments to Claims 9-11 and 25-29 setting forth an annealing temperature that is greater than or equal to 1150°C but less than or equal to 1350°C is supported by the original disclosure just as support was found in both the noted decisions for a narrow range claim based upon a disclosure of a wider range. Therefore, the objection to Claim 9 and Claims 25-29 under 35 U.S.C. §132 should be withdrawn as should the rejection of Claims 9-11, 14, 15 and 24-29 under the first paragraph of 35 U.S.C. §112.

Turning to the rejection of Claims 9, 11, 14, 15 and 24-29 as being unpatentable over Bose, each of independent Claims 9 and 25-29, as well as new independent Claim 36, define over Bose because they require an annealing temperature which is greater than or equal to

1150°C but less than or equal to 1350°C. As was noted during the interview, Bose cannot be reasonably said to teach or suggest a temperature of 1150°C relative to the suggestion that annealing occurs "about 1100°C." Accordingly, the rejection of Claims 9, 11, 14, 15, and 24-29 is believed to be overcome.

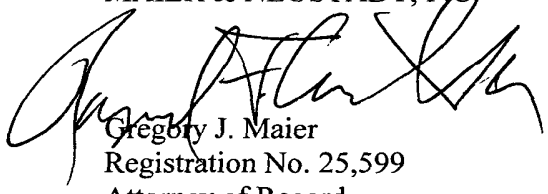
Wolf cures none of the deficiencies noted above as to Bose, the rejection of Claim 10 is also believed to be improper and Claim 10 should also be allowed.

In addition, because each of new Claims 37-53 either depends on one of the independent claims noted above or new independent Claim 36, which further includes the above-noted annealing temperature range that is not taught or suggested by Bose or Wolf, each of these claims should also be allowed.

Since no further issues are believed to remain outstanding in this application, it is believed that this application is clearly in a condition for formal allowance and an early and favorable action to this effect is, therefore, respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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Marked-Up Copy
Serial No: 09/358,388
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IN THE CLAIMS

Please amend Claims 9-11 and 25-29, as follows:

--9. (Thrice Amended) A method of manufacturing a semiconductor substrate having shallow trench isolation regions and device regions sandwiched by the shallow trench isolation regions, comprising [the steps of]:

(a) [a first step of] forming a plurality of grooves on part of a surface of the semiconductor substrate;

(b) [a second step of] depositing oxide films in the grooves by an organic silicon based CVD method [and then];

(c) removing upper parts of the oxide films so as to planarize a surface of a resultant structure until surface areas of the semiconductor substrate are substantially exposed, each of the exposed surface areas of the semiconductor substrate serving as a top surface of a corresponding device region; and

[(c) a third step of] (d) annealing the oxide films, after said removing, at a substrate temperature which is greater than [1100°C] or equal to 1150°C but less than or equal to 1350°C so that dislocation density generated in the corresponding device region in a vicinity of the grooves is less than [$1/\mu m^2$] $1\ \mu m^{-2}$.

10. (Amended) The method of claim 9, wherein the organic silicon based CVD method [in the second step] is any of atmospheric pressure CVD method, low pressure CVD method, plasma CVD method, photo CVD method, and liquid phase CVD method.

11. (Amended) The method of claim 9, wherein the annealing [in the third step] is carried out in any one of reductive gas such as H_2 insert gas such as He, Ne, AR, Kr, or Xe, O_2, N_2, HCl, CO, and CO_2, or in a gas mixture consisting of any mixture of two kinds of gas selected from these gases.

25. (Twice Amended) A method of manufacturing a semiconductor substrate having shallow trench isolation regions and device regions sandwiched by the shallow trench isolation regions, comprising [the steps of]:

(a) forming a plurality of grooves on part of a surface of the semiconductor substrate;

(b) depositing oxide films in the grooves by an organic silicon based CVD method;

(c) annealing the oxide films at a substrate temperature which is greater than [1100°C] or equal to 1150°C but less than or equal to 1350°C so the dislocation density generated in the semiconductor substrate in a vicinity of the grooves is less than [$1/\mu m^2$] $1\ \mu m^{-2}$; and

(d) removing upper parts of the oxide films, after said annealing, so as to planarize a surface of a resultant structure until surface areas of the semiconductor substrate are substantially exposed, each of the exposed surface areas of the semiconductor substrate serving as a top surface of a corresponding device region.

26. (Twice Amended) A method of manufacturing a semiconductor substrate having shallow trench isolation, comprising [the steps of]:

(a) forming a plurality of grooves on part of a surface of the semiconductor substrate;

(b) burying oxide films in the grooves by an organic silicon based CVD method; and

(c) annealing said oxide films at a substrate temperature which is greater than [1100°C] or equal to 1150°C, but less than or equal to 1350°C so that said oxide films include higher order ring structures higher than 5-fold ring and lower order ring structures

lower than 4-fold ring at respective predetermined rates, and an etching rate by ammonium fluoride solution of said oxide films is less than 130 nm/min, which is substantially identical to that of a thermal oxide film.

27. (Twice Amended) A method of manufacturing a semiconductor substrate having shallow trench isolation, comprising [the steps of]:

(a) forming a plurality of grooves on part of a surface of the semiconductor substrate;

(b) burying oxide films in the grooves by an organic silicon based CVD method; and

(c) annealing the oxide films at a substrate temperature which is greater than [1100°C] or equal to 1150°C but less than or equal to 1350°C so that said oxide films include higher order ring structures higher than 5-fold ring and lower order ring structures lower than 4-fold ring at respective predetermined rates, the respective predetermined rates of the ring structures are determined according to rates of integrated Raman intensities corresponding to respective ring structures to a total integrated Raman intensity, and the ring structures are formed to satisfy either of or both conditions that said higher order ring structures are substantially more than 85% of an overall ring structure and said lower order ring structures are substantially less than 15% of the overall ring structure.

28. (Twice Amended) A method of manufacturing a semiconductor substrate having shallow trench isolation regions and device regions sandwiched by the shallow trench isolation regions, comprising [the steps of]:

(a) forming a plurality of grooves on part of a surface of the semiconductor substrate;

(b) forming thin thermal oxidation films [as part of] on the inner walls of the grooves;

(c) depositing oxide films directly on the thin thermal oxidation films by an organic silicon based CVD method;

(d) removing upper parts of the oxide films so as to planarize a surface of a resultant structure until surface areas of the semiconductor substrate are substantially exposed, each of the exposed surface areas of the semiconductor substrate serving as a top surface of a corresponding device region; and

(e) annealing the oxide films, after said removing, at a substrate temperature which is greater than [1100°C] or equal to 1150°C but less than or equal to 1350°C so that dislocation density generated in the corresponding device region in a vicinity of the grooves is less than [$1/\mu m^2$] $1\ \mu m^{-2}$.

29. (Twice Amended) A method of manufacturing a semiconductor substrate having shallow trench isolation regions and device regions sandwiched by the shallow trench isolation regions, comprising [the steps of]:

(a) forming a plurality of grooves on part of a surface of the semiconductor substrate;

(b) forming thin thermal oxidation films [as part of] on the inner walls of the grooves;

(c) depositing oxide films directly on the thin thermal oxidation films by an organic silicon based CVD method;

(d) annealing the oxide films at a substrate temperature which is greater than [1100°C] or equal to 1150°C but less than or equal to 1350°C so that dislocation density generated in the semiconductor substrate in a vicinity of the grooves is less than [$1/\mu m^2$] $1\ \mu m^{-2}$; and

(e) removing upper parts of the oxide films, after said annealing, so as to planarize a surface of the resulting structure until surface areas of the semiconductor substrate are

substantially exposed, each of the exposed surface areas of the semiconductor substrate serving as a top surface of a corresponding device region.

Please add new Claims 30-53 as follows:

30. (New) The method of claim 9, wherein said oxide films are deposited in the grooves so as not to include any nitride film in the grooves.

31. (New) The method of claim 25, wherein said oxide films are deposited in the grooves so as not to include any nitride film in the grooves.

32. (New) The method of claim 26, wherein said oxide films are buried in the grooves so as not to include any nitride film in the grooves.

33. (New) The method of claim 27, wherein said oxide films are buried in the grooves so as not to include any nitride film in the grooves.

34. (New) The method of claim 28, wherein said thin thermal oxidation films are formed by thermally oxidizing inner walls of the grooves.

35. (New) The method of claim 29, wherein said thin thermal oxidation films are formed by thermally oxidizing inner walls of the grooves.

36. (New) A method for forming a microelectronic structure, the method comprising:

(a) forming a mask layer on a substrate wherein the mask layer exposes a part of the substrate;

(b) forming a groove in the exposed part of the substrate;

(c) depositing a layer of an insulating film so as to fill the groove and cover the mask layer;

(d) annealing said insulating film at a temperature which is greater than or equal to 1150°C but less than or equal to 1350°C.

37. (New) The method of claim 36, wherein said annealing is performed for a period of time of about 1 hour to about 2 hours.

38. (New) The method of claim 36, wherein said annealing is performed for a period of time of about 1 hour.

39. (New) The method of claim 36, wherein said annealing is performed in an inert atmosphere.

40. (New) The method of claim 36, wherein said annealing is performed in an atmosphere of nitrogen (N_2).

41. (New) The method of claim 36, further comprising:

planarizing said insulating material so that the substrate is exposed.

42. (New) The method of claim 41, wherein said planarizing comprises using a Chemical Dry Etching (CDE) method.

43. (New) The method of claim 36, wherein said forming the mask layer comprises forming an oxide layer on the substrate.

44. (New) The method of claim 36, wherein said forming the layer of the insulating material comprises forming an oxide layer on inner walls of the groove and depositing an insulating material on the oxide layer to fill the groove.

45. (New) The method of claim 44, wherein said depositing the insulating material comprises forming an oxide by chemical vapor deposition.

46. (New) The method of claim 36, wherein said insulating film is deposited in the groove so as not to include any nitride film in the groove.

47. (New) The method of claim 36, wherein a width of the groove is 0.5 μm.

48. (New) The method of claim 36, wherein said groove tapers.

49. (New) The method of claim 36, wherein said depositing the layer of the insulating film is configured to deposit the insulating film at a thickness larger than a half of a width of the groove.

50. (New) The method of claim 36, wherein said forming the mask is configured to provide a plurality of grooves at a cross sectional view so as to define a SDG region between a couple of the grooves at the cross sectional view.

51. (New) The method of claim 50, wherein said SDG region has a width of 0.3 μm, measured between the couple of the grooves.

52. (New) The method of claim 50, further comprising:

forming source and drain regions in the SDG region sandwiched by the grooves.

53. (New) The method of claim 50, wherein each of the grooves has an aspect ratio d/l_{1x} of less than 10, which is defined by a dimensional ratio of a depth d to a width 1_{1x} of an opening at a top of each of the grooves.

The issues dealt with in the deleted two paragraphs had been settled before the date of oral argument. The court regrets the error. We had considerable difficulty keeping straight what was settled and what was not, and particularly so with further settlements made and announced to the Court after briefing and oral argument were complete. We have attempted not to adjudicate any settled issue, although this necessitated restructuring the opinion after it was virtually complete. We are advised that Appeal No. 75-2030 has not been settled with respect to Sauquoit v. Leesona issues. (Cf. Slip Op., p. 6470, left column, lines 6-10, 541 F.2d 1133, 192 USPQ 246, left column, lines 48-52) The parties advise that they anticipate settlement. They are directed to take necessary steps if they settle, to get the case off our docket of record. If they do not settle, it still is not apparent how or why further consideration by us is necessary, and we will dispose of the appeal sua sponte if the parties do not promptly advise why we should not do so, and what we should do instead.

Court of Customs and Patent Appeals

In re Blaser, Germscheid, and Worms

No. 76-694 Decided June 9, 1977

PATENTS

1. **Patentability — Anticipation — Patents — Foreign (§51.2215)**

German patent that has effective date as reference more than 1 year prior to filing date of first continuation-in-part application is statutory bar against application, under 35 U.S.C. 102(b), unless applicants are entitled, under 35 U.S.C. 120 and 35 U.S.C. 112, to filing date of great grandparent application in which they claimed benefit of German priority application that subsequently matured into German patent.

2. **Amendments to patent application — New matter (§13.5)**

Applications for patent — Continuing (§15.3)

Specification — Sufficiency of disclosure (§62.7)

Function of description requirement is to ensure that applicant had possession, as of filing date of application relied on, of specific subject matter claimed by him; claim limitation added by amendment but adequately described in application as filed, and in great grandparent, does not constitute new matter and does not bar applicants from claiming benefit of filing date of its great grandparent application in which they claimed benefit of German priority application that matured into German patent cited against application.

3. **Specification — Sufficiency of disclosure (§62.7)**

Fact that person skilled in art, given great grandparent application, might proceed to run series of experiments and derive lower limit of 0.6 mols is not sufficient indication to that person that 0.6 is described as parameter of process.

4. **Specification — Sufficiency of disclosure (§62.7)**

Disclosure of heating reaction blend to temperatures between 60° C and 200° C in great grandparent application supports recitation of 80° C to 200° C in present case.

Particular patents — Acylation Products

Blaser, Germscheid, and Worms, Process for the Manufacture of Acylation Products of Phosphorous Acid, rejection of claims 1, 2, 4-6, and 12 reversed; rejection of claims 7-11 affirmed.

Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of Bruno Blaser, Hans-Gunther Germscheid, and Karl-Heinz Worms, Serial No. 869,437, filed Sept. 25, 1969, continuation of application, Serial No. 703,789, filed Feb. 5, 1968, continuation of application, Serial No. 446,742, filed Apr. 8, 1965, continuation in part of application, Serial No. 159,159, filed Dec. 13, 1961, claiming benefit of German patent 1,148,235, issued May 9, 1963.

From decision rejecting claims 1, 2, and 4-12, applicants appeal. Modified; Markey, Chief Judge, with whom Baldwin, Judge, joins, dissenting in part, with opinion.

Nelson Littell, Jr., New York, N.Y. (Charles A. Muserlian, New York, N.Y., of counsel) for appellants.

Joseph F. Nakamura (Henry W. Tarring, II, of counsel) for Commissioner of Patents and Trademarks.

Before Markey, Chief Judge, Rich, Baldwin, and Miller, Associate Judges, and Shiro Kashiwa, Associate Judge, United States Court of Claims.

Kashiwa, Judge.[1]

This appeal is from the decision of the Patent and Trademark Office (PTO) Board of Appeals (board), adhered to on reconsideration, affirming the examiner's rejection of claims 1, 2, and 4-12, which are all the claims in application serial No. 869,437, filed September 25, 1969, entitled "Process for the Manufacture of Acylation Products of Phosphorous Acid." We affirm in part and reverse in part.

The Invention

Appellants' invention is directed to a process for preparing acylation products of phosphorous acid having at least two phosphorous atoms in their molecules, which process comprises mixing phosphorus trichloride with a mixture of carboxylic acid and water under specified reaction conditions. The claims on appeal are reproduced below, with our emphasis supplied to underscore disputed limitations:

1. A process for the manufacture of acylation products of a phosphorous acid having at least two phosphorous atoms in their molecules, which consists essentially of the steps of mixing one mol of phosphorus trichloride with from 2.5 to 3 mols of a mixture of carboxylic acid plus water, said acid being selected from the group consisting of an aliphatic monocarboxylic acid having 2 to 12 carbon atoms and benzoic acid; *the share of said water in said mixture being from 1.2 to 1.5 mols;* at a temperature up to 80° C; heating the reaction blend thus obtained, after completing of said mixing to 100° C to 160° C and recovering said acylation products.

2. The process as defined in Claim 1, wherein said temperature of 100° C to 160° C is held for 1 to 6 hours.

4. The process as defined in claim 1 wherein said heated blend is allowed to cool, and the acylation product precipitated therefrom.

5. The process as defined in claim 1 wherein said trichloride is introduced into said mixture of acid and water.

6. The process as defined in claim 1, wherein said water is added into a mixture of said chloride with said acid.

7. A process for the manufacture of acylation products of a phosphorous acid having at least two phosphorus atoms in their molecules, which consists essentially of the steps of mixing one mol of phosphorus trichloride with from 2.5 to 3 mols of a mixture of carboxylic acid plus water, said acid being selected from the group consisting of an aliphatic monocarboxylic acid having 2 to 12 carbon atoms and benzoic acid; *the share of said water in said mixture being from 0.6 to 1.6 mols;* at a temperature up to 80° C; *heating the reaction blend thus obtained,* after completing of said mixing *to 80° C to 200° C* and recovering said acylation products.

8. The process as defined in Claim 7, wherein said temperature of 80° C to 200° C is held for 1 to 6 hours.

9. The process as defined in Claim 7, wherein said heated blend is allowed to cool, and the acylation product precipitated therefrom.

10. The process as defined in Claim 7 wherein said trichloride is introduced into said mixture of acid and water.

11. The process as defined in Claim 7 wherein said water is added into a mixture of said chloride with said acid.

12. The process of Claim 7, *wherein said share of said water in said mixture is from 1.2 to 1.6 mols.*

The Rejections

This case is one of a series of continuing applications, the first filed on April 8, 1965, which applications are continuations-in-part of great-grandparent application serial No. 159,159 (hereinafter SN 159,159).[2] In SN 159,159 appellants claimed the benefit of their German priority application which subsequently matured into a German patent, the sole reference relied upon by the examiner in this case:

German Patent (Blaser et al.)	1,148,235	May 9, 1963

[1] Since the German patent has an effective date as a reference (May 9, 1963) more than one year prior to the filing date of the first continuation-in-part application (April

[1] Judge of the United States Court of Claims sitting by designation pursuant to 28 USC 293(a).

[2] The present case is a continuation of application serial No. 703,789, filed February 5, 1968, now abandoned, which is a continuation of application serial No. 446,742, filed April 8, 1965, now abandoned, which, in turn, is a continuation-in-part of application serial No. 159,159, filed December 13, 1961, now abandoned.

8, 1965), the patent constitutes a statutory bar against the present case under 35 USC 102(b)[3] unless appellants are entitled to the filing date of SN 159,159 under the provisions of 35 USC 120 and 35 USC 112, para. 1.[4]

The board found inadequate support in the present case for the limitation "1.2 to 1.5 mols," added by amendment to claims 1, 2, and 4-6. Accordingly, the board decided that this limitation constitutes new matter and that appellants are not entitled to the benefit of the filing date of SN 159,159 for claims 1, 2, and 4-6. Furthermore, the board found inadequate support in SN 159,159 for the limitations "0.6 to 1.6 mols," "1.2 to 1.6 mols," and "80° C to 200° C" in present claims 7-12. Accordingly, the board decided that appellants are not entitled to the benefit of the filing date of SN 159,159 for claims 7-12. In sum, the earliest date to which appellants were entitled under the board's holding was that of the first continuation-in-part application, serial No. 446,742, filed April 8, 1965. Since the German patent has an effective date of May 9, 1963 and discloses several specific examples which meet every limitation of each claim on appeal, the board affirmed the examiner's rejection of all the claims under 35 USC 102(b). Since the limitation "1.2 to 1.5 mols" was added by amendment to present claims 1, 2, and 4-6, the board also affirmed the examiner's rejection of these claims as drawn to new matter, 35 USC 132.[5]

Issue

The dispositive issue is whether appellants have complied with 35 USC 112, para. 1, by providing an adequate description in the present case and in SN 159,159 of specific limitations occurring in the claims on appeal.

Opinion

Claims 1, 2, and 4-6.

The sole disputed limitation in these claims is "the share of said water in said mixture [of carboxylic acid and water] being from 1.2 to 1.5 mols." Appellants urge that the range of 1.2 to 1.5, although not expressly set forth in SN 159,159, was supported therein as a preferred range in working examples 1-6. On this point the board, in its modified opinion on petition for reconsideration, agreed with appellants. In the present case appellants have added new examples 1 and 2, which cover a range of 0.6 to 1.6 mols water, while examples 3-8 are virtually identical to the previous examples 1-6 in SN 159,159. The board found that there is no basis in the present case, when considering all the relevant examples, for carving out specific examples 3-8 for the purpose of supporting the range of 1.2 to 1.5.

[2] The function of the description requirement, however, is to ensure that the

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[3] 35 USC 102(b) reads as follows:

§102. *Conditions for patentability; novelty and loss of right to patent.* A person shall be entitled to a patent unless -

* * *

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States
* * *

[4] 35 USC 120 reads as follows:

§120. *Benefit of earlier filing date in the United States.* An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

35 USC 112, para. 1, reads:

§112. *Specification.* The specification shall contain *a written description of the invention,* and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most clearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention. [Our emphasis.]

[5] 35 USC 132 reads as follows:

§132. *Notice of rejection; Reexamination.* Whenever, on examination, any claim for a patent is rejected, or any objection or requirement made, the Commissioner shall notify the applicant thereof, stating the reasons for such rejection, or objection or requirement, together with such information and references as may be useful in judging of the propriety of continuing the prosecution of his application; and if after receiving such notice, the applicant persists in his claim for a patent, with or without amendment, the application shall be reexamined. No amendment shall introduce new matter into the disclosure of the invention.

applicant had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him. In re Wertheim, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). Here, the board has agreed that in SN 159,159 appellants described as their invention a process using 1.2 to 1.5 mols water. Nevertheless, the board found that upon filing the present application with added examples 1 and 2 appellants in effect lost possession of this subject matter, i.e., that the present application did not describe the same invention as that disclosed in SN 159,159. We believe that this position is manifestly unsound. As a factual matter, we believe that persons skilled in the art would consider processes employing 1.2 to 1.5 mols water as part of appellants' invention and would have been led by both SN 159,159 and the present case, as filed, so to conclude. See In re Wertheim, supra, 541 F.2d at 265, 191 USPQ at 98. Since the range in question was adequately described in SN 159,159 and in the present case as filed, this claim limitation, added by amendment, does not constitute new matter and appellants are entitled to the benefit of the filing date of SN 159,159 for claims 1, 2, and 4-6. Accordingly, we reverse the rejection of these claims under 35 USC 102(b) and 35 USC 132.[6]

Claims 7-12.

Claims 7-11 recite "the share of said water in said mixture being from 0.6 to 1.6 mols." In SN 159,159 appellants disclosed that, whereas carboxylic acid previously had been used alone, it was now feasible to replace a part of the carboxylic acid with water, where the share of the water may be up to 1.6 mols. No lower amount of water was disclosed, except that, of course, some water must be present. In the present application, appellants disclose the share of water as 0.6 mols to 1.6 mols and add examples 1 and 2 which cover this range. Appellants have discovered that "reduction of the amount of water used [below 0.6 mols] renders the process unusable in practice owing to the greatly prolonged reaction times."

[3] Appellants urge that the lower limit of 0.6 mols water is readily ascertainable from the disclosure of SN 159,159. Given this disclosure, say appellants, it would have been simple for one skilled in the art to run a series of experiments using varied amounts of water, such as examples 1 and 2 in the present case, to determine that the reaction time increases greatly when the amount of water decreases below 0.6 mols. However, the flaw in this argument is that enablement and obviousness are not the issues; description of the invention is. That a person skilled in the art, given SN 159,159, might proceed to run a series of experiments and derive a lower limit of 0.6 mols is not a sufficient indication to that person that 0.6 is described as a parameter of appellants' process. See In re Winkhaus, 527 F.2d 637, 188 USPQ 129 (CCPA 1975). After the filing date of SN 159,159, appellants themselves disclosed a series of experiments which demonstrate that reduction of the amount of water below 0.6 mols renders their process unusable in practice due to greatly prolonged reaction times. It follows that appellants are not entitled to the benefit of this filing date for claims 7-11 on appeal, which recite 0.6 mols as the lower limit of water used. See In re Wertheim, supra at 264-65, 191 USPQ at 98. Accordingly, we affirm the rejection of these claims under 35 USC 102(b).

Claims 7-12 recite "heating the reaction blend thus obtained, after completing of said mixing to 80° C to 200° C and recovering said acylation products." In SN 159,159 appellants disclosed initially mixing the starting materials at a temperature up to 80° C and heating the reaction blend thus obtained to temperatures between 60° C and 200° C. The question presented is whether the disclosed range of 60° C to 200° C in SN 159,159 supports the recitation of 80° C to 200° C in the claims on appeal.

[4] Appellants rely on the rationale of In re Wertheim, supra, as "clearly applicable here." Appellants urge that if a disclosure of 25-60% solids content taught those skilled in the art that 35-60% was part of the invention in Wertheim, although the latter range was not expressly mentioned therein, then appellants' disclosure of 60° C to 200° C in SN 159,159 would likewise teach 80° C to 200° C as part of appellants' invention. We agree with appellants that Wertheim is controlling on this point. We further note that in SN 159,159 appellants disclosed initially mixing the starting materials at a temperature up to 80° C prior to heating the reaction blend thus obtained to a maximum temperature of 200° C. We conclude that SN 159,159 adequately supports the limitation "80° C to 200° C" as recited in claims 7-12.

[6] We note in passing that the PTO does not contend that there is a gap in the continuity of disclosure of appellants' examples which span the range 1.2 to 1.5. We therefore take as unchallenged the fact that such examples appear in each of the chain of cases filed by appellants.

Claim 12 recites "said share of said water in said mixture is from 1.2 to 1.6 mols." In SN 159,159 the upper limit of 1.6 mols was expressly disclosed and examples 1-6 therein encompassed the range of 1.2 to 1.5 mols. As a factual matter, persons skilled in the art would consider processes employing 1.2 to 1.6 mols water as part of appellants' invention and would have been led by SN 159,159 so to conclude. See the discussion of claims 1, 2, and 4-6, supra. Since the "80° C to 200° C" and "1.2 to 1.6 mols" limitations were adequately described in SN 159,159, appellants are entitled to the benefit of the filing date of SN 159,159 for claim 12. Accordingly, we reverse the rejection of this claim under 35 USC 102(b).[7]

In conclusion, we reverse the rejection of claims 1, 2, 4-6, and 12 and we affirm the rejection of claims 7-11.

Modified.

Markey, Chief Judge, with whom Baldwin, Judge, joins, dissenting.

With all due deference, I dissent from affirmance of the rejection of claims 7-11. The majority's treatment of these claims is, in my view, in direct conflict with its treatment of the others. The disclosure in SN 159,159 is that of a range, extending from *some* water (say 0.1 mols) to 1.6 mols, thus encompassing 0.6-1.6 mols. In my view, "some" describes 0.6. Appellants' later disclosure is that a quantity of water below 0.6 mols will work, but more slowly. Appellants are merely claiming less than they would have had a right to claim in SN 159,159, and have properly acted to limit their present disclosure and claims to the more practical parameters of 0.6-1.6 mols. Such "speaking up" is to be encouraged. We should not punish honesty.

[7] The PTO contends only that SN 159,159 does not support the "80° C to 200° C" and "1.2 to 1.6 mols" limitations. We therefore take as unchallenged the fact that these limitations are supported by each of the other cases filed by appellants.

Court of Customs and Patent Appeals

In re Hoffmann, Weiberg, and Weigert

No. 76-724 Decided June 9, 1977

PATENTS

1. Construction of specification and claims — Defining terms (§22.45)

Patentability — Invention — Specific cases — Chemical (§51.5093)

Patentability — Aggregation or combination — New or better result (§51.157)

Words and phrases (§70.)

Superior results yielded from use of prior art catalyst in claimed process, alleged to follow from degree of degradation resistance, is not adequate basis for finding unobviousness over reference that teaches chemical inertness of catalysts as "substantial advantage" attendant upon their use; "highly corrosive" connotes not only extremes of pH but also extreme oxidizing or reducing environments.

Particular patents — Percarboxylic Acid

Hoffmann, Weiberg, and Weigert, Process for Production of Percarboxylic Acid, rejection of claims 3-9, 11, and 13-17 affirmed.

Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of Peter Hoffmann, Otto Weiberg, and Wolfgang Weigert, Serial No. 129,170, filed Mar. 29, 1971. From decision rejecting claims 3-9, 11, and 13-17, applicants appeal. Affirmed.

Alvin Guttag, Watson T. Scott, William Bullinger, and Cushman, Darby & Cushman, all of Washington, D.C., for appellants.

Joseph F. Nakamura (Jack E. Armore, of counsel) for Commissioner of Patents and Trademarks.

Before Markey, Chief Judge, and Rich, Baldwin, Lane, and Miller, Associate Judges.

Rich, Judge.

This appeal is from the decision of the Patent and Trademark Office (PTO) Board of Appeals (board) affirming the rejection of claims 3-9, 11, and 13-17 in application serial No. 129,170, filed March 29, 1971, for

ATTACHMENT

191 USPQ

n 110°F." and "less than 500 microns. inal product temperature," it appears, fers to the temperature at which so-called und water is driven off from the product heating after the vacuum drying phase s ended. We find no description of final oduct temperature in appellants' Swiss plication. It is not disputed that pellants do not expressly disclose final oduct temperatures or this secondary dry- g step. They again appeal, however, to the luger patent disclosure and to an amend- ent entered in the application on appeal ot objected to as new matter by the ex- miner) to show that final product mperatures are conventional in the art and ed not be expressly disclosed. The amend- ent is clearly irrelevant since claim 4, an iginally filed claim, is its own written scription in the appealed application. In Gardner, 475 F.2d 1389, 177 USPQ 396, hearing denied, 480 F.2d 879, 178 USPQ 9 (CCPA 1973). The issue is whether the wiss application describes the claimed final oduct temperature, not whether the ins- nt application does so. The Pfluger patent sclosure is also unavailable to appellants. he Swiss application was filed before luger issued, which means that for the rposes of §112 the Pfluger disclosure is ot evidence of what those skilled in the art nsidered conventional at the time the wiss application was filed. In re Glass, 492 2d 1228, 181 USPQ 31 (CCPA 1974).

Claims 1 and 4, therefore, are not entitled the benefit of the filing date of appellants' wiss application.

[8] Claims 2, 37, and 38, which claim a lids content range of "between 35% and)%," present a different question. They early claim a range *within* the described oad range of 25% to 60% solids; the ques- on is whether, *on the facts*, the PTO has esented sufficient reason to doubt that the oader described range also describes the mewhat narrower claimed range. We note at there is no evidence, and the PTO does ot contend otherwise, that there is in fact y distinction, in terms of the operability of ppellants' process or of the achieving of any sired result, between the claimed lower nit of solids content and that disclosed in e Swiss application. We see an important practical distinction between broad generic *chemical compound* inventions, for example, as in In re Ruschig, supra, in which each compound within the genus is a separate embodiment of the invention, and inventions like that at bar, in which the range of solids content is but one of several process parameters. What those skilled in the art would expect from using 34% solids content in the concentrated extract prior to foaming instead of 35% is a different matter from what those skilled in the art would expect from the next adjacent homolog of a compound whose properties are disclosed in the specification. We wish to make it clear that we are not creating a rule applicable to all description requirement cases involving ranges. Where it is clear, for instance, that the broad described range pertains to a different invention than the narrower (and subsumed) claimed range, then the broader range does not describe the narrower range. In re Baird, 52 CCPA 1747, 348 F.2d 974, 146 USPQ 579 (1965); In re Draeger, 32 CCPA 1217, 150 F.2d 572, 66 USPQ 247 (1945).

[9] In the context of *this* invention, in light of the description of the invention as employing solids contents within the range of 25-60% along with specific embodiments of 36% and 50%, we are of the opinion that, as a factual matter, persons skilled in the art would consider processes employing a 35-60% solids content range to be part of appellants' invention and would be led by the Swiss disclosure so to conclude. Cf. In re Ruschig, supra. The PTO has done nothing more than to argue lack of literal support, which is not enough. If lack of literal support alone were enough to support a rejection under §112, then the statement of In re Lukach, supra, 58 CCPA at 1235, 442 F.2d at 969, 169 USPQ at 796, that "the invention claimed does not have to be described in ipsis verbis in order to satisfy the description requirement of §112," is empty verbiage. The burden of showing that the claimed invention is not described in the specification rests on the PTO in the first instance, and it is up to the PTO to give reasons why a description not in ipsis verbis is insufficient.

We conclude, therefore, that claims 2, 37, and 38 are entitled to the benefit of the filing date of appellants' Swiss application.

Since the Pfluger patent is not available as prior art as of its 1966 date under §§102(e) and 103 against claims 2, 37, and 38, the rejection of those claims is reversed. The rejection of claims 1 and 4 is affirmed. Appellants filed no affidavit under Rule 204(c) showing a date of invention for claims 1 and 4 prior

to Pfluger's 1 Gemassmer, 51 (138 USPQ 22 antedated Pfluge 35 USC 119 and

The New Matter

[10] The issu whether the limit carried forwar affected by this foam be ground 0.25 mm" before the instant appl USC 132. This n a finding by the I filed did not des the converse of w 492 F.2d 859, 86 1974), is true in new matter rejec jection of the cla quirement of 35 The solicitor agr

We conclude specification clea dinary skill in t vented processes ground to a par mm," and not, processes in whi larger than 2 mm

The specific (emphasis ours):

> At the end tract is remo sheet which *m* fragments sui fragments *may* particle size w range 0.25 to

In a modifi frozen extract form of *plates o ly* ground to t

The examples ground particles mm. While the the 0.25 to 2.0 r think it clearly i native embodime the foam may be undisclosed size, obviously smalle grinding only *aft* argues that the c per limit, wherefo clear implication tion is that app

That the final product temperature limitation not material, as appellants argue, does not atter when the limitation is copied. Im- ateriality excuses only *failure* to copy a limita- on of a patent claim. See Brailsford v. Lavet, 50 CPA 1367, 318 F.2d 942, 138 USPQ 28 (1963); CFR 1.205(a).